

CHEIRODON ORTEGAI, A NEW MARKEDLY
SEXUALLY DIMORPHIC CHEIRODONTINE
(PISCES: CHARACOIDEA) FROM THE RÍO
UCAYALI OF PERU

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Abstract.—*Cheirodon ortegai*, a new species of cheirodontine characoid fish, is described from the Ucayali River system of Peru. Within *Cheirodon* this species can be distinguished by its relatively stout body, horizontal midside stripe running from the supracleithrum to the caudal-fin base and slightly oblique band running above the anal-fin base. Sexually dimorphic characters distinctive for *C. ortegai* include the presence in males of pronounced lateral swellings at the base of the adipose dorsal fin and along the ventral border of the caudal peduncle, the presence of numerous bony hooks on the pelvic fins, and the cuplike form of the pelvic fins. Medially the inner rays of the pelvic fins form a partially tubular channel that extends posteriorly ventral to the male vent to the anal-fin origin. This adaptation along with the apparently glandular tissue mass at the base of the pelvic fins appears to be unique to this species among characoids.

The new species of cheirodontine characoid described herein was discovered by one of us (RPV) in a collection of upper Amazonian fishes sent to the American Museum of Natural History by Sr. Hernán Ortega of the Universidad Nacional de San Marcos, Pucallpa, Peru. The junior author independently recognized this form as undescribed from material sent to him by I. J. Isbrücker of the Amsterdam Aquarium. All specimens with definite locality data are from the region of Masisea, Peru, at or near the junction of the Río Pachitea with the Río Ucayali.

Cheirodon ortegai, new species

Figs. 1-2, Table 1

Holotype.—American Museum of Natural History (AMNH) 35950, 31.2 mm standard length (SL) collected 27 November 1976 in a woodland pool connected with the Río Ucayali at Cocha Roba, 5 km downriver from Masisea, District of Masisea, Province Coronel Portillo, Department of Loreto, Peru (approx. Lat. 8°35'S, Long. 74°22'W).

Paratypes.—3 males (AMNH 35951 and British Museum (Natural History) [BMNH] 1977. 6.9-138), 31.2-31.5 mm SL and 1 female (AMNH



Fig. 1. *Cheirodon ortegai*, holotype (upper), male, AMNH 35950, 31.4 mm SL; and paratype (lower), female, AMNH 35951, 31.2 mm SL.

35951) 28.0 mm SL, taken with the holotype; one juvenile female? (Géry collection), collected by W. Baumler, 1965, in the Río Pachitea at its junction with the Río Ucayali; 1 male, 34.3 mm SL (Géry collection), no locality data; 1 female, 34.0 mm SL (Géry collection), no locality data.

Diagnosis.—*Cheirodon ortegai* can be distinguished from all other nominal *Cheirodon* species by its pronounced midside horizontal stripe and the slightly oblique pigment band running dorsal to the base of the anal fin. The only other nominal *Cheirodon* species with a black stripe above the anal fin is *C. luelingi*. That species differs from *C. ortegai* in its more slender overall form (greatest body depth 25–27% of SL, in contrast to 34–37% for *C. ortegai*) and in lacking the heavy horizontal midside stripe. Males of *Cheirodon ortegai* are also distinctive in their cup-shaped, hook-bearing pelvic fins and the presence of a foliate tissue mass at the base of the pelvic fin. These characters, together with the possession of pronounced lateral swellings at the base of the adipose dorsal fin and along the ventral border of the caudal peduncle, appear to be unique to *C. ortegai* among characoids.

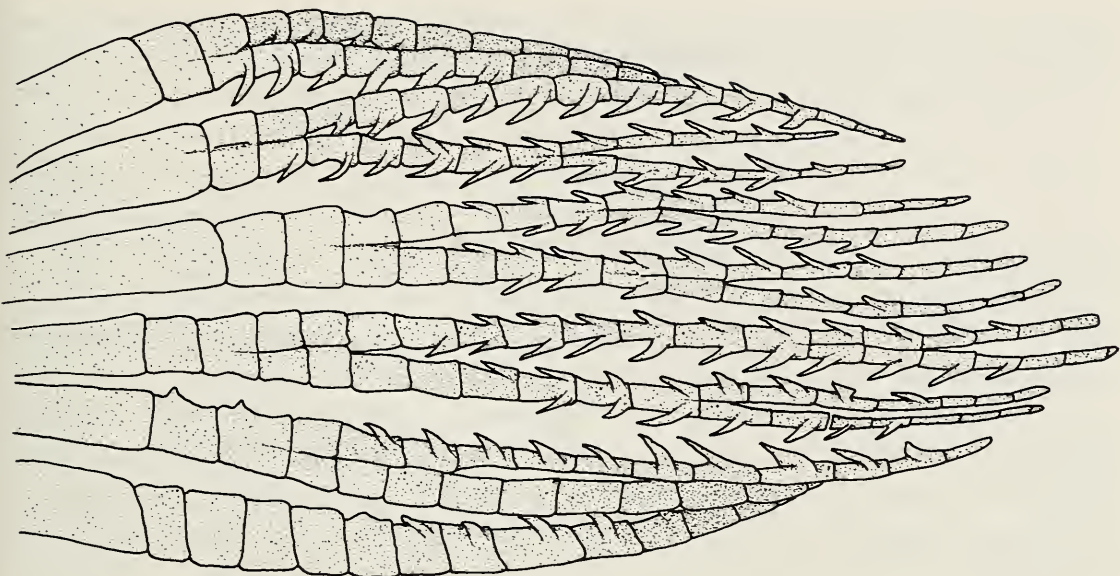


Fig. 2. Left pelvic fin of male *Cheirodon ortegai*, two medialmost pelvic-fin rays not visible.

Description.—Table 1 gives measurements of the holotype and paratypes. Body moderately deep, relatively rotund, especially that of females. Greatest body depth at anterior dorsal-fin origin. Profile in males straight from tip of snout to base of occipital process, slightly convex from rear of occipital process to dorsal-fin origin; profile in females gently convex from tip of snout to dorsal-fin origin. Body profile at base of dorsal fin straight in females, slightly convex in males. Posterior to dorsal fin, profile straight to origin of dorsal caudal-fin lobe in females, distinctly convex at adipose-fin base in males. Males with pronounced lateral expansion of body surface at adipose-fin base. Ventral profile of head smoothly convex to below pectoral-fin base in both sexes. Belly to pelvic-fin insertion only slightly convex, more so in females. Pelvic-fin musculature expanded to form a lateral bulge in males. Anal-fin base nearly straight in females, distinctly sigmoid in males with anterior portion convex and posterior region concave; change in curvature located at base of posterior-most hook-bearing anal rays. Anal fin base relatively shorter in females than males (Table 1). Head relatively large. Snout pointed with mouth slightly superior and lower jaw extending distinctly anterior of tip of snout. Maxilla relatively long; posterior tip of maxilla extends ventrally to the horizontal plane through ventral surface of eye and posteriorly to vertical plane through anterior surface of eye. Lateral surface of maxilla slightly concave with a bony laterally-directed lip along its posterior border. Eye diameter relatively large in proportion to head (33–35% of head length). Nostrils separated by a flap of skin; posterior nostril

Table 1.—Measurements of *Cheirodon ortegai*, new species. Standard length is expressed in mm; other measurements are percentages of standard length.

	Holotype	Paratypes			
		4 ♂		3 ♀	
		Range	Average	Range	Average
Standard length	31.45	31.2–34.3		18.0–34.1	
Greatest depth	34.1	33.6–37.0	34.8	34.3–37.0	35.6
Snout to dorsal-fin origin	54.0	53.3–58.0	54.9	55.4–57.6	56.4
Snout to pelvic-fin origin	56.1	55.8–59.1	56.8	55.7–58.5	56.8
Snout to anal-fin origin	68.1	67.3–70.0	68.7	67.6–70.0	68.7
Snout to pectoral-fin origin	29.0	28.5–29.2	28.7	27.6–29.3	28.2
Least depth of caudal peduncle	9.7	9.7–10.0	9.9	9.2–9.6	9.4
Length of caudal peduncle	9.6	9.9–10.1	10.0	9.2–9.7	9.5
Pectoral-fin length	22.4	21.6–22.4	22.2	19.3–21.7	20.4
Pelvic-fin length	13.0	12.7–13.7	13.0	13.2–14.0	13.7
Length of anal-fin base	25.3	23.4–24.0	23.7	21.6–22.8	22.1
Head length	28.7	28.3–28.6	28.4	27.3–29.2	28.0
Eye	9.8	9.4–9.9	9.6	9.8–10.1	9.9
Snout	6.4	6.3–6.7	6.4	6.0–6.9	6.5
Postorbital	11.2	12.2–13.1	12.6	10.9–12.5	11.8
Interorbital	9.3	9.3–9.8	9.5	9.0–9.8	9.4
Upper-jaw length	10.3	10.2–10.9	10.6	9.8–10.2	9.9

twice as large as anterior, somewhat crescent shaped. Enlarged posterior lamellae of olfactory rosette nearly reaching surface of posterior nostril. Fronto-parietal fontanele extensive; parietals completely separated, frontals in contact only at epiphyseal bar. Antorbital and first, fourth, fifth, and sixth infraorbitals not ossified. Second infraorbital reduced, triangular. Third infraorbital large, but not in contact with sensory tube of preopercle.

Teeth in a single series in each jaw. All teeth compressed, expanding outwards to a hemicircular multicuspid edge, middle cusp always longest. Premaxilla with 6 or 7 teeth, all except most lateral with 9 cusps, posteriormost tooth in series with 7 cusps. Partially formed premaxillary replacement teeth embedded in inner flesh of premaxilla. Maxilla with 2 teeth, each with 5 cusps. Dentary with 6 to 8 teeth (2 posteriormost difficult to see except in cleared and stained specimens), 5 medial teeth of each dentary of equal size, with 7 cusps; remaining teeth smaller, with 5 cusps (rarely 3 on terminal tooth). Replacement teeth of dentary all in a replacement tooth trench. All palatine and pterygoid bones toothless.

Scales cycloid, thin. Scales in a lateral series 31 in holotype (29 in 2 specimens, 30 in 2 specimens, 31 in 2 specimens, 33 in one specimen), 4 to 7 perforated lateral line scales. Transverse scales from dorsal-fin origin to anal-fin origin 10 or 11. Scales not extending onto caudal fin. Large mid-ventral scales overlapping a mass of foliate (glandular?) tissue between pelvic insertions.

Dorsal fin pointed, anterior rays longest, ii,8,i in all specimens. Anal fin ii,21 in holotype (ii,21 in two specimens, ii,22 in one specimen, iii,21 in 3 specimens, iii,22 in one specimen). Anal-fin margin nearly straight in males, distinctly emarginate in females. Anal fins in males with numerous bony hooks on each side of last unbranched and first 12 or 13 branched rays. Eleven to twelve hooks on each face of last unbranched ray, 11 to 14 hooks on side of branched rays 1 to 8; 4 to 7 hooks on remaining hook-bearing branched rays. Hooks more strongly developed on basal segments of branched rays 7 to 10. Pectoral fin i,12,1 in holotype (i,10,i in 1 specimen, i,11,i in 2 specimens, ii,10,i in 2 specimens, ii,11,i in 2 specimens). Pectoral fin pointed; first ray longest, reaching about two-thirds distance to vertical through pelvic origin. Pelvic fins, i,7 in holotype (i,6 in one specimen, i,7 in 5 specimens, i,8 in 1 specimen). Pelvic fins pointed, reaching anal-fin origin. Pelvic-fin rays in males with numerous bony hooks on lateral rays, 3 or 4 hooks on median rays. Medial separation of pelvic-fin insertions more pronounced in males, with posteriormost median scale enlarged and overlapping a mass of foliate (glandular?) tissue located between the bases of the pelvic fins. Both terminal enlarged scale and foliate tissue mass enveloped dorsally by median pelvic-fin rays. Pelvic-fin rays in preserved females oriented in a nearly horizontal plane. In males, in contrast, fins are transversely curved resulting in a ventrally-open, cup-shaped fin. Medially the inner portions of the pelvic fin form an incompletely tubular funnel extending posteriorly below the male vent. Caudal fin not sexually dimorphic, emarginate, with 4 or 5 very weakly developed procurent rays which are only evident in cleared and stained specimens.

Coloration.—Overall color pattern reminiscent of that of *Heterocharax macrolepis*, a member of the tribe Characini (Géry, 1978:309). Ground color tan. Head dark dorsally, particularly dorsal and posterior to epiphyseal bar. Snout, premaxilla, maxilla, and region anterior to orbit pigmented. Postorbital region and cheek with a series of large chromatophores, more pronounced in males. Opercle with scattered chromatophores and an oblique stripe running across dorsal portion of bone in some specimens, others with only scattered pigmentation. A prominent horizontal midside stripe formed of large chromatophores from the supracleithrum to the caudal base; stripe thinning rapidly on caudal peduncle and barely continuous with a round spot on the rear of the caudal peduncle and anterior portion of middle caudal rays. Caudal spot relatively more diffuse in larger specimens. A series of

separated chromatophores ventral to the horizontal midside stripe in two irregular, slightly posteroventrally sloping patterns; dorsal series extends from the junction of the midside stripe and supracleithrum posteriorly to the vertical through the pelvic-fin insertion and ventral series slopes posteroventrally along anterior portion of body, running parallel to dorsal series posteriorly. Ventral series less well developed in smaller females and juveniles. A dark, slightly posterodorsally oblique band extends posteriorly from an imaginary vertical through the anal-fin origin to above the base of the posteriormost anal-fin rays. Stripe thickest anteriorly; gradually thinning posteriorly in females, thicker and more abruptly thinning posteriorly in males. Scales dorsal to midside horizontal body stripe outlined posteriorly by a series of chromatophores; pigmentation heaviest dorsally, particularly along middorsal line where it forms an indistinct median stripe running from rear of head to dorsal edge of caudal peduncle. Number of chromatophores in region directly above anterior portion of midside body stripe increasing with age, evenly distributed over scales in largest specimens. Median fins with scattered chromatophores. Pigmentation heaviest on anterior rays of dorsal and anal fins, along anterior portion of adipose dorsal fin and along basal portions of caudal-fin rays. Pelvic fins with scattered chromatophores, particularly on bases of intraray membranes. Dorsalmost pectoral-fin rays pigmented, otherwise pectorals clear.

Relationships.—As discussed by Fink and Weitzman (1974), many aspects of cheirodontine phylogeny are poorly understood at this time. Those authors pointed out the difficulties associated with the retention of *Pseudocheirodon* as a taxon distinct from *Cheirodon* (*sensu stricto*). The difficulties with such a separation are further demonstrated by the characters found in *C. ortegai*. This species lacks a definitive triangular pseudotympanum (a region of reduced musculature lateral to the anterior chamber of the swimbladder) and possesses only a few reduced "interhemals" (ventral procurrent caudal-fin rays), characters supposedly diagnostic for *Pseudocheirodon*. On the other hand, *Cheirodon ortegai* has rounded cutting edges to the teeth and multiple anal-fin hooks, characters traditionally considered characteristic of *Cheirodon*. The possession by *C. ortegai* of characters supposedly diagnostic for both *Pseudocheirodon* and *Cheirodon* further supports Fink and Weitzman's (1974) merging of *Pseudocheirodon* into the latter genus.

The relationship of *Cheirodon ortegai* to other species of the genus is rather uncertain. A black stripe above the anal-fin base also occurs in *C. luelingi* (Géry, 1964). That species, which also occurs in the Ucayali system, differs, however, in overall morphology. The pronounced sexual dimorphism, long anal-fin base, and the possession of 7 to 9 tooth cusps in *C.*

ortegai also occur among *Cheirodon* species such as *C. gracilis*, *C. interruptus*, *C. insignis*, *C. madeirae*, *C. notemelas*, and *C. piaba*. However, an understanding of the significance of these similarities, those with *C. luelingi*, and the characters shared with those species previously placed in *Pseudocheirodon*, awaits a better understanding of cheirodontine phylogeny.

Remarks.—As noted previously, the lateral swellings at the base of the adipose dorsal fin and along the ventral border of the caudal peduncle, together with the foliate tissue mass at the pelvic-fin bases appear to be unique to *Cheirodon ortegai* among cheirodontines. Histological examination of the lateral swellings associated with the adipose dorsal fin and caudal peduncle show them to be formed primarily by lateral expansions of portions of the epaxial and hypaxial musculature. In addition, adipose tissue deposits are also quite prominent in the swellings. The exact function of the expanded musculature or of the fatty tissue deposits is undetermined. Similarly, given our lack of information on the reproductive habits of this species, it is impossible to determine the purpose of the foliate, evidently glandular, tissue mass at the pelvic-fin base, or if the tubular channel formed by the medial surfaces of the pelvic fins serves as a conduit for sperm delivery during reproduction. A pronounced sexual dimorphism characterized by the presence of evidently glandular tissue and associated modified scales occurs elsewhere in *Cheirodon* (*sensu* Fink and Weitzman, 1974). However, in *C. heterura* and *C. gorgonae* (previously assigned to the genus *Compsura*) the glandular tissue and specialized scales are located on the caudal peduncle and caudal base. A resolution of the significance, if any, of these seemingly analogous adaptations within *Cheirodon* must await a better understanding of cheirodontine phylogeny.

Etymology.—The trivial name, *ortegai*, honors Sr. Hernán Ortega who has collected many valuable specimens for the senior author.

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